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M. R. LONGACRE.

CASH REGISTER AND INDICATOR.

No. 429,927. Patented June 10, 1890.

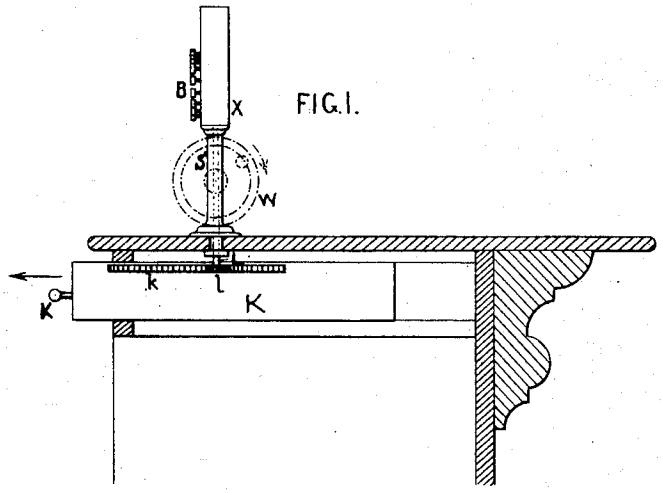
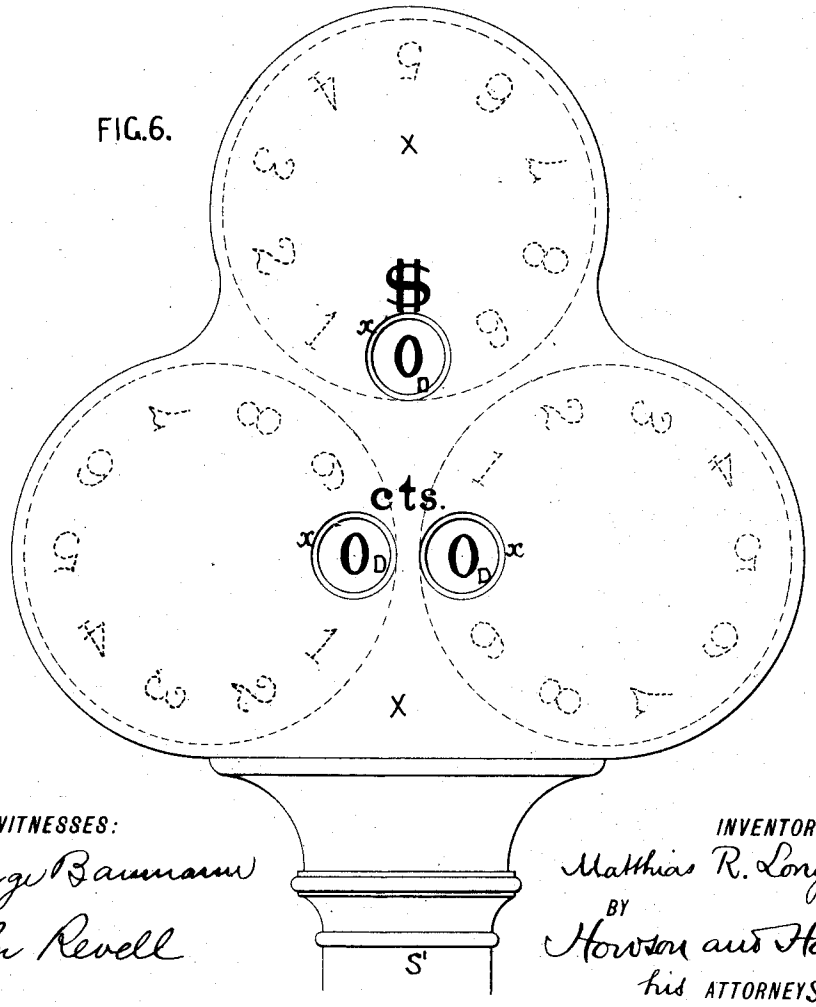


FIG. 1.

FIG. 6.



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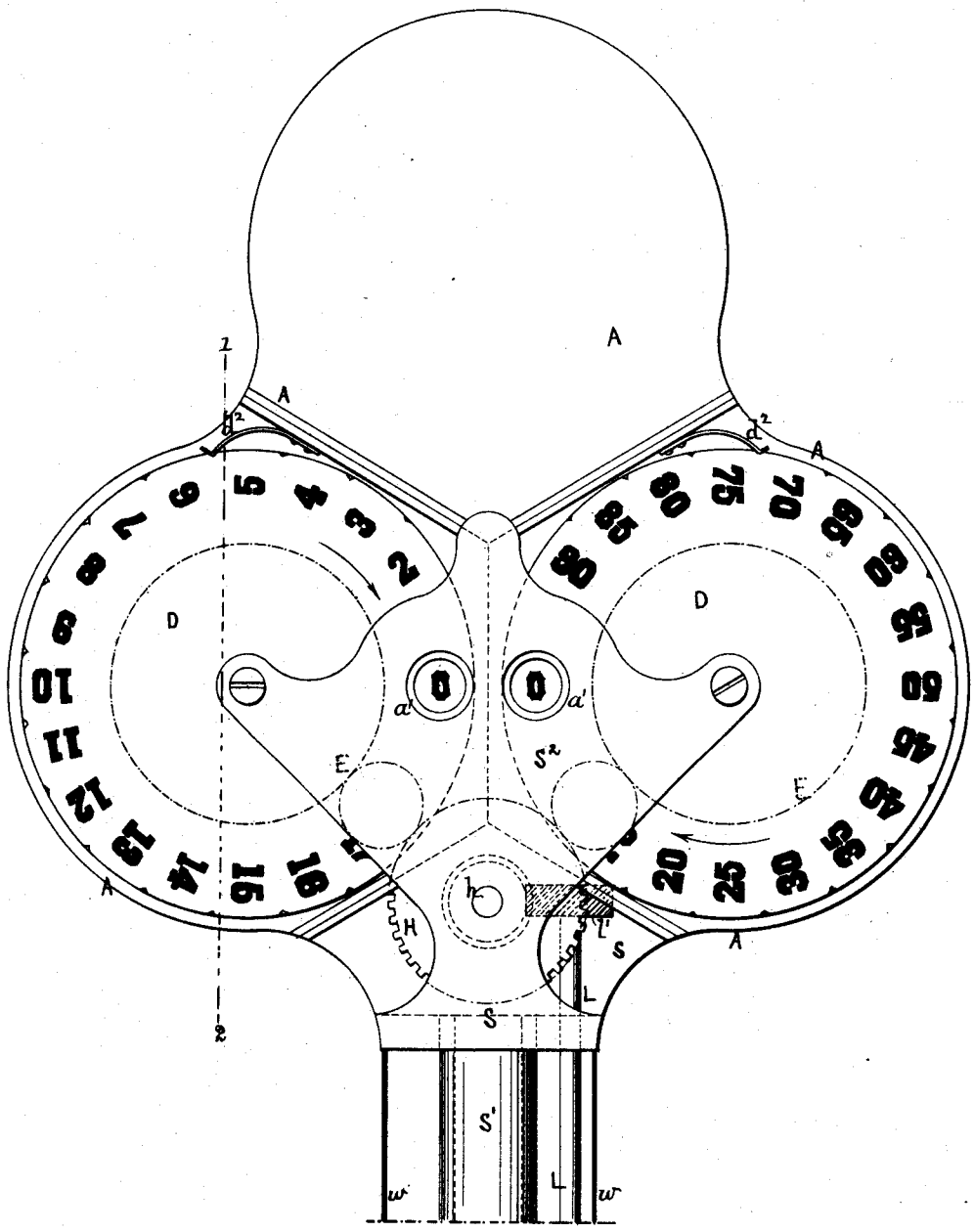
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No. 429,927. Patented June 10, 1890.

FIG. 2.



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(No Model.) 4 Sheets—Sheet 3.

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CASH REGISTER AND INDICATOR.

No. 429,927. Patented June 10, 1890.

FIG. 3.

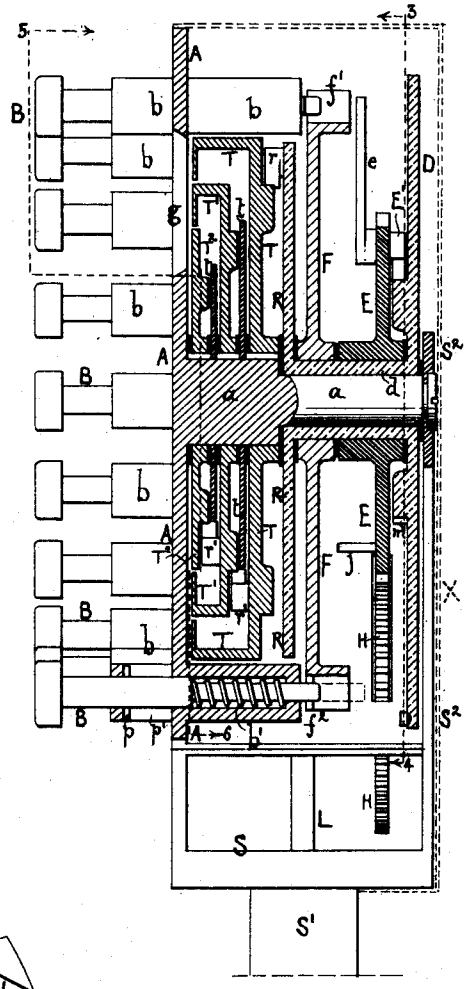


FIG. 7.

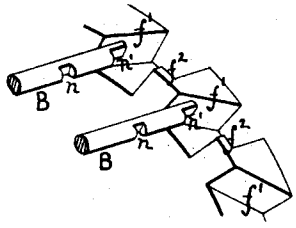


FIG. 8.

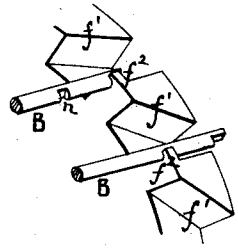
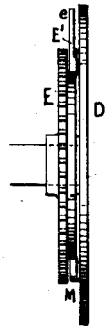


FIG. 9.



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M. R. LONGACRE.

CASH REGISTER AND INDICATOR.

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FIG. 4.

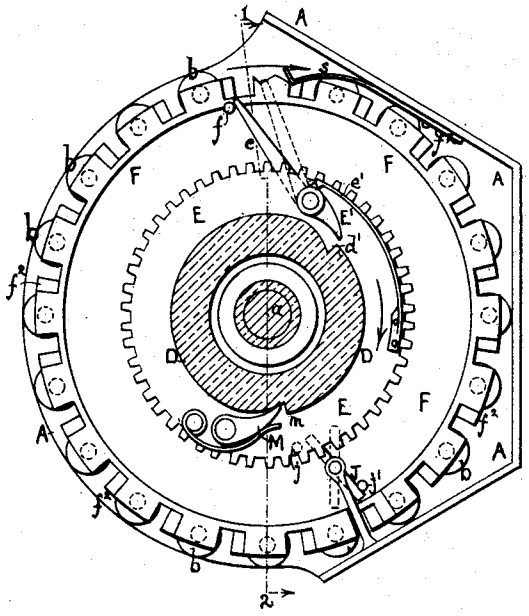
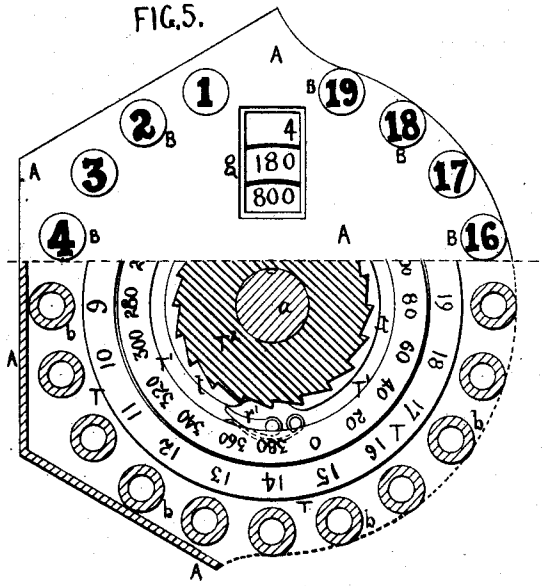


FIG. 5.



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UNITED STATES PATENT OFFICE.

MATTHIAS R. LONGACRE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE LONGACRE COMPANY, LIMITED, OF SAME PLACE.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 429,927, dated June 10, 1890.

Application filed December 31, 1889. Serial No. 335,484. (No model.)

To all whom it may concern:

Be it known that I, MATTHIAS R. LONGACRE, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented an Improved Cash Registering and Indicating Machine, of which the following is a specification.

My invention relates to cash indicating and registering machines of that class in which there are employed as characteristic features a movable indicator carrying figures in connection with a series of numbered keys, the operation of any of which determines the extent of movement of the indicator, and consequently the figure to be exhibited or indicated.

The object of my present invention is to construct such an indicator and register which shall be simple and economical in construction, positive and reliable in operation, and not easily put out of order.

In the accompanying drawings, Figure 1 is a vertical section showing how my improved cash indicator and register may be applied to an ordinary store-counter and in connection with the cash drawer or till. Fig. 2 is a front view, drawn to a larger scale, of one construction of my improved machine, but with the front plate or outer casing removed. Fig. 3 is a vertical section on the line 1 2, Figs. 2 and 4, but drawn to a larger scale. Fig. 4 is a sectional view drawn on the line 3 4, Fig. 3, but to a somewhat smaller scale than Fig. 3. Fig. 5 is a similar sectional view drawn on the line 5 6, Fig. 3, but looking in a direction the reverse of the view Fig. 4. Fig. 6 is a front view of another construction of machine embodying my improvements. Figs. 7 and 8 are perspective views illustrating a detail of my invention. Fig. 9 is a view of a modification.

In the drawings of my present application I have shown the movable indicator as in the form of a flat disk or wheel adapted to rotate on a central axis and bearing upon one face, near the periphery, the several spaced figures or numbers. I wish it to be understood, however, that I have adopted this particular form of movable indicator only for convenience of construction, and do not wish to restrict myself thereto, as any other well-known form of movable indicator bearing figures, and whether a wheel or not, might be employed in its stead.

My machine may be constructed to make indications either on the system in which the possible successive indications progress at five-cent or ten-cent or similar intervals, or, on the other hand, on the system in which the unit is the rate of progression. The latter may be termed a "units-machine," while the former may be termed an "interval-machine."

In Figs. 2 and 5 I have shown an interval-machine provided with two indicators, one for the cents with the figures "0" to "95," at intervals of five, and the other for the dollars with figures "0" to "19" at unit intervals.

In Fig. 6 I have shown a units-machine, and in this case I prefer to employ at least three indicators, one (the upper one in the view) for the dollars, and the two others (the lower ones) for the two columns of cents, and each indicator bears the figures "0" to "9" at intervals of one.

Each moving indicator has in connection with it a series of controlling-keys numbered in correspondence with the figures or numbers on that indicator.

Each moving indicator, with its set of keys and immediate operating devices, forms a complete system in itself, and may have its separate frame. In Fig. 2, for instance, I have shown the two indicating systems as having separate and detachable frames bolted together and mounted upon a common stand S, carried by a vertical tubular post S′, which, as shown in Fig. 1, may be mounted upon the ordinary counter of a store, or may be mounted upon a suitable portable box or cabinet provided or not with a till or cash-drawer; or the apparatus may be mounted in any suitable place with or without the tubular post, and the frames of the indicating systems may be in one piece or several, as desired. In the case of the interval-machine illustrated in Fig. 2, although there are only two indicating systems, the frame may be constructed as though for a third upper system, and this top space may be utilized for an additional dollars-indicator or in any suit-

able way—as, for instance, either for advertising or for the totalizing or registering wheels.

As I have already said, each movable indicator, with its set of keys and its immediate operating devices, forms a system in itself, and the following description of one of the indicating systems will apply equally well to all, reference being had to Figs. 2, 3, 4, and 5. These several views are specifically views of the dollars-indicator of the interval-machine; but they illustrate equally well (except in the matter of the number upon the indicators) the systems for the cents of the interval-machine or the dollars or cents of the units-machine.

The frame A of the indicator carries a central spindle, which I have shown as a fixed spindle *a* for the rotating indicator-wheel D. This indicating-wheel D carries on its front—that is, the face of the machine which is presented to the customer—a series of numbers any one of which will show through a suitable opening at the proper moment in the front of the casing. I may here note that the front of the machine may simply be covered by a sheet-metal casing X, Figs. 3 and 6, removable at pleasure to get at the inside works when needed.

In the machine illustrated in Figs. 2 and 3 there is a plate S^2, forming a part of the frame to which the front ends of the spindles *a* are secured, and this front plate has openings *a'* in it at proper points to allow the figures to show through, and the removable sheet-metal casing X, which goes over all this, has similar openings *x* at corresponding points, Fig. 6. The frame is provided at the rear with a series of transverse elongated bearings *b* for the reception and guidance of the several controlling-keys B, which, as will be seen, are arranged in a circle. The heads of the keys are of course on the opposite side of the machine from that on which the indications are made to the customer, in order that these numbered heads may present themselves for the convenient operation of the salesman. Suitable spiral springs *b'*, encircling the stems of the keys in the bearings, tend to push them outward, and pins *p*, carried by the keys and working in slots *p'* in the bearings, limit this outward movement. Any one of these keys when pressed inward by the salesman acts as a tripping device, as hereinafter described, and also as a stop to determine the extent of movement of the indicating-wheel through the medium of devices which I will now explain.

In machines of this character which have heretofore been constructed—such as shown in my own patents, Nos. 407,748 and 407,749—the movable indicator has been spring-impelled and the keys have been the means of retaining the indicator in its normal position against the action of the springs, and when one of the keys has been operated the indicator would thereby be released and at once operated by the spring. In my present machine, however, I dispense entirely with the springs, and instead thereof I provide means for imparting a positive motion to the moving indicator after the key has been operated. The keys, instead of normally restraining the movement of the indicator against the action of the spring, have under normal conditions no operative connection with the moving indicator; but the operation of any one of the keys serves to throw into operative engagement with the indicator a device having a handle, (such as a till or cash-drawer or a hand-lever,) so that the operator by grasping this handle can readily impart a positive motion to the indicator, and the extent of that positive motion of the indicator is determined by the key which has been previously operated, and which at the proper moment releases the indicator again from connection with the positively-moved device.

A gear-wheel E, which is shown as mounted upon the central spindle *a*, but over a sleeve *d*, attached to or formed in one with the indicator, Fig. 3, carries a pawl E'. This pawl when the parts are at their normal positions at rest is in the position indicated in full lines in Fig. 4; but by the operation of any one of the keys it can be thrown into engagement with a notch or tooth *d'*, formed in or on or attached to the indicator-wheel D, Fig. 4. To throw this pawl into engagement with the indicator-wheel, I provide a tripping ring or disk F, which has a projection *f* to act upon the tail *e* of the pawl E'. A spring *e'*, acting upon a V-shaped cam upon the pawl, will hold the latter in either of the extreme positions to which it may be moved—that is, either in or out of engagement with the indicator-wheel. The tripping-disk is operated by any one of the keys, and for that purpose notches are formed in the periphery of the disk opposite the several key-stems, and on one side of each notch is an incline *f'*, adapted to be acted on by the stem of the key when the latter is pushed in, Figs. 7 and 8, so that the pawl-tripping disk is then moved from the position shown in full lines in Fig. 4 to an extent a little less than the length of the incline. By that movement the pin *f*, acting on the tail of the pawl E', throws the latter over into engagement with the indicator-wheel D. If now a positive motion be imparted to the wheel E, which carries the pawl E', and which has been put into engagement with the indicator, the indicator-disk will be moved, the stem of the key, which has been pressed in, has passed through the notch in the tripping-disk, and its end is beyond the latter in the path of the tail of the pawl E', so that when the pawl comes round to that key-stem it will be disengaged from the indicator-disk, and the latter will stop at the determined position, although the wheel E continues to revolve. In order to retain the operated key in its inward position at least until such time as the tail of the pawl comes round to be

struck by it, I make the tripping-disk F also serve as a locking-disk by causing projections f^2, Fig. 7, on the opposite edge of each notch from the incline f' to enter a notch n in the key-stem, when the latter is pushed inward to move the tripping-disk, as shown in Fig. 8. At the same time the projections on the edges of the other notches in the tripping-disk enter at n', Fig. 7, under the stems and lock all the unoperated keys, so that they cannot then be pressed inward until the tripping-disk is returned to its normal position. The tripping-disk is returned to its normal position when the wheel E reaches the end of its first or forward revolution by a pin j on the wheel striking one end of a lever J, pivoted to the casing, the other end of the lever acting on a pin j' on the tripping-disk to return it to the position shown in full lines in Fig. 4. In order to retain the tripping-disk in either of its extreme positions, and also to insure its entering the notch n of the operated key, I provide a spring s, acting on a V-shaped cam on the margin of the disk, as illustrated in Fig. 4.

In order to retain the indicating-wheel D in any position to which it may be moved, with the figure directly opposite the opening in the casing, I provide a friction-spring d^2, adapted to enter spaced notches in the periphery of the disk, as illustrated in Fig. 2.

To restore the indicating-wheel to its normal position with zero showing through the opening in the casing, a restoring-pawl M is provided upon the wheel E, facing in the opposite direction from the indicating-pawl E'. This restoring-pawl normally lies in engagement with a notch or tooth m on the indicator-disk, and when the latter rotates in the direction of the arrow, Fig. 4, with the wheel E, the restoring-pawl travels with it, remaining in engagement with the notch or tooth, and when the indicator-disk ceases to move by the disengagement of the pawl E' the restoring-pawl M then simply rides free from the projecting portion of the indicator-wheel, in which the engaging notches d' and m are found; but by returning the wheel E in the opposite direction when it has reached the end of its forward movement the restoring-pawl M rides back until it again engages with the notch m in the indicator, and then it carries the latter back to the zero position, from which it started. The wheel E has then completed its return movement.

As a means of imparting a positive motion to the operating-wheel E, I prefer to use a cash-drawer K such as shown in Fig. 1, and the rack k on the cash-drawer may be geared by any suitable intermediate mechanism to the said wheel E. In Fig. 1 I have shown how the rack k may gear into a pinion l on the lower end of the vertical shaft L, alongside the supporting-post of the machine. This shaft and supporting-post may be inclosed by a suitable sheet-metal cover w, as shown in Fig. 2. The upper end of the vertical shaft L, as shown in Fig. 2, carries a worm l', gearing into a worm-wheel on a horizontal shaft h, which is mounted in bearings in the casing and carries a wheel H, geared directly or through intermediate pinions into the operating-wheels E of the indicating system. I have shown this more fully in Fig. 2 in connection with the interval-machine, but similar or equivalent gearing may be used to operate the wheels E of the three or more indicating systems of the units-machine shown in Fig. 6, and in each case the several indicating and registering mechanisms are grouped about the driving-wheel H as a center.

I wish it to be undertood that I use the term "cash-drawer" here in a sufficiently comprehensive sense to include not only a construction in which the drawer itself moves and imparts motion to the indicator, but also such a construction as where the moving lid or cover of the cash-drawer shall be the means of similarly imparting motion to the indicator.

Instead of employing the drawer to operate the indicator in the manner described, I may use any other handled device, which can be grasped by the operator to make the indication after the appropriate keys have been operated. For instance, I may use a handled wheel or lever with a geared segment on it, which segment gears into a pinion on the upright shaft L, before described. In Fig. 1 I have indicated by dotted lines a wheel W, which is provided with a handle, and has on its side a segmental gear engaging with a pinion on the upright shaft L.

I prefer to combine with the indicating mechanism above described some suitable totalizing or registering mechanism, although I do not wish to confine myself to any special construction of registering or totalizing mechanism. As an illustration of one form of such mechanism, I have shown a series of registering or totalizing wheels T T' T^2 in connection with each indicating system. These totalizing-wheels are mounted upon the central spindle a between the indicating-wheel, its operating-wheel, and the tripping-disk on one side and the back of the casing or frame on the other. An opening g is formed on the back of the casing, through which the numbers can be read by the salesman, Figs. 3 and 5. There is in this instance attached to the indicating-wheel, through the medium of the sleeve d, a pawl-carrying plate, arm, or disk R, which has a pawl r engaging with suitable ratchet-teeth upon the first totalizing or registering disk T. According to the direction in which this pawl r and the teeth on the wheel T are arranged the indicator-disk may thus operate the first registering-wheel either on its forward or backward movement. In the present instance I have shown the register-wheel as arranged to be operated on the return movement of the indicator. At each complete revolution of the first registering-wheel a one-space movement is imparted to the second registering-wheel T' by means of a

pawl r' on the first registering-wheel entering a recess or notch in the fixed intermediate disk t, Figs. 3 and 5, and engaging with one of the ratchet-teeth on the wheel T^2, and moving the latter for the space of one tooth, when the pawl r' again rides out of the notch on the disk t and out of engagement with the teeth upon the wheel T′ until it completes another revolution. In a similar way the second totalizing-wheel T″ at each complete revolution imparts a one-space movement to the third registering-wheel T^2, and so on, according to the number of registering-wheels employed.

It will be readily understood that details in the construction of the machine may be varied without departing from my invention. For instance, instead of mounting the pawl E′ on the operating-wheel E and its engaging-tooth d' upon the indicator, as described, the arrangement may be reversed—that is to say, the pawl E′ may be mounted upon the indicator D, while the engaging-tooth d' is upon the operating-wheel E. I have illustrated such a modification of my invention in the view Fig. 9. Similarly the pawl M may be mounted on the indicator D and the notch or tooth m on the wheel E, as shown in this same Fig. 9, this pawl and its tooth being in such case reversed from the position shown in Fig. 4.

I will now briefly describe the operation of the device, although the foregoing explanation of the construction will no doubt have made this tolerably clear. In this explanation of the operation I will assume that a cash-drawer is used as the handled operating device for imparting a positive motion to the indicator, although, as I have said, I do not wish to confine myself thereto. Suppose, now, the machine to be an interval-machine and the cash-drawer to be closed and it is desired to make an indication and registry of a sale of two dollars and seventy-five cents. The salesman pushes inward the second key on the dollars-indicator and the 75 key on the cents-indicator, either both at once or one after the other. This will not cause any indication to be shown yet, however, but will simply put the operating-wheels E into engagement with their indicator-disks, and at the same time put the ends of the stems of the operated keys into the paths of the tails of the pawls to release the operating-wheels from engagement with the indicators at the moment when the proper numbers come opposite to the openings in the casing of the machine. The salesman then pulls the drawer out, and in doing so carries around the wheels E to the full extent of their movement, which is almost, but not quite, a complete revolution. The indicator-wheels, being in engagement with the drawer from the beginning of its movement, move with the drawer; but the indicator-wheels stop their revolutions at the positions determined by the keys pressed in, as already described. The salesman now having put the money in the drawer and obtained the change, where needed, pushes the drawer in again, and in doing so returns the wheels E to their first or normal positions, and with them he returns the indicators also, which then show zeros at the openings in the casing. At the same time the amount of the sale is carried over to the registering mechanism, either on the forward or backward movement of the indicators, according to the way in which it may be constructed, as before stated. If preferred, the forward movement of the indicator may be made while the drawer is being pushed in, instead of as it is being pulled out; but that I do not consider so desirable.

It will be seen that until and unless a key is pressed in, the movable indicator is out of engagement with the drawer and will not be operated, although the drawer may be pushed out or in to any extent, so that normally the drawer is free to be moved in and out without operating either the indicator or the registering mechanism.

I claim as my invention—

1. An indicating mechanism having a fixed frame, a movable indicator provided with a series of figures, and a series of keys mounted in the fixed frame and numbered to correspond with the indicator, and a handled device to impart a positive motion to the indicator first in one direction to an extent determined by the operated key to make an indication, and then in the reverse direction to return the indicator to zero, all substantially as described.

2. An indicating mechanism having a movable indicator provided with a series of keys numbered to correspond with the indicator, and a cash-drawer to impart a positive motion to the indicator first in one direction to an extent determined by the operated key to make an indication, and then in the reverse direction to turn the indicator to zero, all substantially as described.

3. The combination of a movable indicator having a series of figures and an operating gear-wheel therefor normally out of engagement with the indicator with a series of keys numbered to correspond with the latter, and any one of which, when operated, engages the said wheel with the indicator and afterward disengages them at a point determined by the key operated, and with a cash-drawer to move the operating-wheel to make an indication, and also to return the indicator to zero.

4. Two or more indicating systems, each having a movable indicator provided with a series of figures and a series of keys numbered to correspond with the indicator, and any one of which, when operated, determines the extent of movement of the indicator, in combination with an operating gear-wheel common to all the systems, disengaging mechanism between the said operating-wheel and each indicator, and a handled device to give a positive movement to the said wheel first in one direction to make an indication, and

then in the reverse direction to return the indicators to zero, all substantially as described.

5. Two or more indicating systems, each having a movable indicator provided with a series of figures, an operating-wheel therefor, and a series of keys numbered to correspond with the indicator, and any one of which, when operated, determines the extent of movement of the indicator, in combination with a driving-wheel geared to the said operating-wheels of all the systems and a cash-drawer adapted to impart a positive motion to the said driving-wheel first in one direction to make an indication, and then in the other direction to return the indicators to zero, substantially as described.

6. The combination of a movable indicator and a series of keys, any one of which, when operated, determines the extent of movement of the said indicator, with a cash-drawer normally free to be moved in and out independently of the indicating mechanism, and means, substantially as described, for throwing the said indicator into engagement with the drawer upon the operation of a key, whereby the drawer imparts motion to the movable indicator to make an indication and to return it to zero, all substantially as described.

7. An indicating-machine having one or more movable indicators provided each with a series of figures and a series of keys numbered to correspond with the indicator, and any one of which, when operated, determines the extent of movement of the indicator, in combination with a gear-wheel to operate the indicators and a cash-drawer having a rack geared to the said wheel, all substantially as described.

8. An indicating and registering mechanism having a fixed frame, a movable indicator provided with a series of figures, and one or more registering-wheels on the same spindle with the indicator, in combination with a series of keys mounted on the said fixed frame and numbered to correspond with the said indicator, and a handled device which imparts a positive motion to the latter to make an indication after a key has been operated and to an extent determined by the said key and to make a corresponding registry.

9. Two or more indicating and registering systems, each having a movable indicator provided with a series of figures and one or more registering-wheels on the same spindle with the indicator, an operating-wheel therefor, and a series of keys numbered to correspond with the indicator, in combination with a driving-wheel geared to the said operating-wheels of all the systems, and having the same definite extent of movement at every indicating operation to carry each indicator to an extent of movement determined by the operated key of its system, and to make a corresponding registry, substantially as described.

10. An indicating and registering mechanism having a movable indicator provided with a series of figures, one or more registering-wheels on the same spindle with the indicator, and a series of keys numbered to correspond with the indicator, and any one of which, when operated, determines the distance to which the indicator can be moved, in combination with a cash-drawer geared to the indicator to make an indication after a key has been operated, and to make a corresponding registry.

11. The combination of a movable indicator provided with a series of figures and a handled device to move the indicator first in one direction to make an indication, and then in the reverse direction to return the indicator to zero, disengaging mechanism between the indicator and said handled device, with a series of keys numbered to correspond with the indicator, and any one of which, when operated, is adapted to throw the said handled device and indicator out of engagement at a point in the movement of the indicator determined by the key operated, all substantially as described.

12. The combination of a movable indicator provided with a series of figures, an operating-wheel therefor, one or more registering-wheels on the same spindle with the indicator, and disengaging mechanism between the indicator and the wheel with a series of keys numbered to correspond with the indicator, and any one of which, as the indicator is moved, throws the wheel and indicator out of engagement, and thus determines the extent of movement of the indicator and registering wheel or wheels, all substantially as described.

13. Two or more indicating mechanisms, each having in a separate and detachable frame a movable indicator, an operating-wheel therefor, and a set of numbered keys controlling the extent of movement of the indicator, in combination with a driving-wheel geared to the operating gear-wheels of the separate mechanisms.

14. Two or more indicating mechanisms, each having a separate and detachable frame, a movable indicator, an operating-wheel therefor, and a set of numbered keys controlling the extent of movement of the indicator, in combination with a driving-wheel geared to the operating-gears of the several mechanisms and a supporting post or frame for the several detachable frames, all substantially as described.

15. An indicating mechanism having the indicator in the form of a rotating disk with the figures on its face, and a frame or casing having an opening on one side to exhibit the indicating-figure with a series of keys to determine the extent of movement of the indicator and arranged in a circle and passing through the frame transversely with their numbered heads on the opposite side of the frame from the exhibiting-opening for the disk, all substantially as described.

16. An indicating-machine having two or more movable indicators provided each with a series of figures and a series of keys numbered to correspond with the indicator, and any one of which, when operated, determines the extent of movement of the indicator, in combination with a gear-wheel to operate the indicators, a vertical post supporting the machine, a cash-drawer having a rack, and a vertical shaft to transmit motion from the drawer to the said gear-wheel, all substantially as described.

17. An indicating-machine having two or more movable indicators provided each with a series of figures and a series of keys numbered to correspond with the indicator, and any one of which, when operated, determines the extent of movement of the indicator, in combination with a gear-wheel to operate the indicators, a vertical post supporting the machine, and a handled device to operate the gear-wheel, all substantially as described.

18. An indicating and registering machine having a series of numbered controlling-keys with a vertical post supporting the said machine with its keys and a shaft to transmit motion to the indicating and registering mechanism, and means to operate the shaft, all substantially as set forth.

19. The combination of two or more indicating mechanisms, each having in a separate and detachable frame or casing a movable indicator in the form of a disk, and an operating-wheel therefor, with a frame supporting a common driving-wheel to gear with the several operating-wheels and supporting the detachable mechanisms arranged about the said driving-wheel as a center.

20. The combination of two or more indicating mechanisms, each having in a separate and detachable frame or casing a movable indicator in the form of a disk, and an operating-wheel therefor, with a frame supporting a common driving-wheel to gear with the several operating-wheels and supporting the detachable mechanisms arranged about the said driving-wheel as a center, and a vertical post to support the said frame.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MATTHIAS R. LONGACRE.

Witnesses:
WILLIAM D. CONNER,
HARRY SMITH.